



SEQUENCE LISTING

#9

<110> Lukyanov, Sergey M.
Fradkov, Arcady F.
Labas, Yulii A.
Matz, Mikhail V.
Terskikh, Alexey

<120> Novel Chromophores/Fluorophores and
Methods for Using the Same

<130> CLON-035CIP

<140> 10/006,992

<141> 2001-12-04

<150> 09/120,330

<151> 1998-12-11

<150> 09/457,898

<151> 1999-12-09

<150> 09/458,144

<151> 1999-12-09

<150> 09/458,477

<151> 1999-12-09

<150> 09/457,556

<151> 1999-12-09

<150> 09/444,338

<151> 1999-11-19

<160> 46

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 687

<212> DNA

<213> anemonia majano

<400> 1

atggctcttt caaacaagtt tatcggagat gacatgaaaa tgacctacca tatggatggc 60
tgtgtcaatg ggcattactt taccgtcaaa ggtgaaggca acgggaagcc atacgaaggg 120
acgcagacct cgacttttaa agtcaccatg gccaacggtg ggccccttgc attctccttt 180
gacatactat ctacagtgtt caagtatgga aatcgatgct ttactgcgta tcctaccagt 240
atgcccgact atttcaaaca agcatttcct gacggaatgt catatgaaag gacttttacc 300
tatgaagatg gaggagttgc tacagccagt tgggaaataa gccttaaagg caactgcttt 360

gagcacaaat ccacgtttca tggagtgaac tttcctgctg atggacctgt gatggcgaag 420
atgacaactg gttgggaccc atcttttgag aaaatgactg tctgcgatgg aatattgaag 480
ggtgatgtca ccgcgttcct catgctgcaa ggaggtggca attacagatg ccaattccac 540
acttcttaca agacaaaaaa accggtgacg atgccaccaa accatgcggt ggaacatcgc 600
attgcgagga ccgaccttga caaaggtggc aacagtgttc agctgacgga gcacgctgtt 660
gcacatataa cctctgttgt ccctttc 687

<210> 2

<211> 229

<212> PRT

<213> anemonia majano

<400> 2

Met	Ala	Leu	Ser	Asn	Lys	Phe	Ile	Gly	Asp	Asp	Met	Lys	Met	Thr	Tyr
1				5				10					15		
His	Met	Asp	Gly	Cys	Val	Asn	Gly	His	Tyr	Phe	Thr	Val	Lys	Gly	Glu
		20					25					30			
Gly	Asn	Gly	Lys	Pro	Tyr	Glu	Gly	Thr	Gln	Thr	Ser	Thr	Phe	Lys	Val
	35					40					45				
Thr	Met	Ala	Asn	Gly	Gly	Pro	Leu	Ala	Phe	Ser	Phe	Asp	Ile	Leu	Ser
	50				55						60				
Thr	Val	Phe	Lys	Tyr	Gly	Asn	Arg	Cys	Phe	Thr	Ala	Tyr	Pro	Thr	Ser
65				70				75						80	
Met	Pro	Asp	Tyr	Phe	Lys	Gln	Ala	Phe	Pro	Asp	Gly	Met	Ser	Tyr	Glu
			85					90					95		
Arg	Thr	Phe	Thr	Tyr	Glu	Asp	Gly	Gly	Val	Ala	Thr	Ala	Ser	Trp	Glu
		100					105					110			
Ile	Ser	Leu	Lys	Gly	Asn	Cys	Phe	Glu	His	Lys	Ser	Thr	Phe	His	Gly
	115					120						125			
Val	Asn	Phe	Pro	Ala	Asp	Gly	Pro	Val	Met	Ala	Lys	Met	Thr	Thr	Gly
	130				135						140				
Trp	Asp	Pro	Ser	Phe	Glu	Lys	Met	Thr	Val	Cys	Asp	Gly	Ile	Leu	Lys
145				150						155				160	
Gly	Asp	Val	Thr	Ala	Phe	Leu	Met	Leu	Gln	Gly	Gly	Gly	Asn	Tyr	Arg
			165					170					175		
Cys	Gln	Phe	His	Thr	Ser	Tyr	Lys	Thr	Lys	Lys	Pro	Val	Thr	Met	Pro
		180					185					190			
Pro	Asn	His	Ala	Val	Glu	His	Arg	Ile	Ala	Arg	Thr	Asp	Leu	Asp	Lys
	195					200					205				
Gly	Gly	Asn	Ser	Val	Gln	Leu	Thr	Glu	His	Ala	Val	Ala	His	Ile	Thr
	210				215						220				
Ser	Val	Val	Pro	Phe											
225															

<210> 3

<211> 1116

<212> DNA

<213> Clavularia species

<220>

<221> misc_feature

<222> 8, 12, 13, 17, 65, 77, 102, 104

<223> n = A,T,C or G

<400> 3

```
tatagganca tnnnggngat tgggggtccaa agcattgtaa ccaacgcaga taacccccag 60
tgggtntcaaa cgcaganaac gcgggaacat tggaaaattg antnttaagg aggcaaggaa 120
tcgggagtaa agttgcgaga aactgaaaaa atgaagtgtg aatttggtgt ctgcctgtcc 180
ttcttgggtcc tcgccatcac aaacgcgaac atttttttga gaaacgaggc tgacttagaa 240
gagaagacat tgagaatacc aaaagctcta accaccatgg gtgtgattaa accagacatg 300
aagattaagc tgaagatgga aggaaatgta aacgggcatg cttttgtgat cgaaggagaa 360
ggagaaggaa agccttacga tgggacacac actttaaacg tggaaagtga ggaaggtgcg 420
cctctgcctt tttcttacga tatcttgtca aacgcgttcc agtacggaaa cagagcattg 480
acaaaatacc cagacgatat agcagactat ttcaagcagt cgtttcccga gggatattcc 540
tgggaaagaa ccatgacttt tgaagacaaa ggcattgtca aagtgaaaag tgacataagc 600
atggaggaag actcctttat ctatgaaatt cgttttgatg ggatgaactt tcctcccaat 660
gggtccggtta tgcagaaaaa aactttgaag tgggaaccat ccactgagat tatgtacgtg 720
cgtgatggag tgctggtcgg agatattagc cattctctgt tgctggaggg aggtggccat 780
taccgatgtg acttcaaaaag tatttacaaa gcaaaaaaag ttgtcaaatt gccagactat 840
cactttgtgg accatcgcac tgagatcttg aaccatgaca aggattacaa caaagtaacg 900
ctgtatgaga atgcagttgc tcgctattct ttgctgccaa gtcaggccta gacaacaagg 960
atactgaaaa catatttgct tgaggggttg tgttggtttt taaaagacat cagctcagca 1020
ttcgttagtt gtaacaaaaa atagctttaa tttttggtgg gattaaatca tagggatttg 1080
ttttagtaat cattttgctt aataaaaagt gccttg 1116
```

<210> 4

<211> 266

<212> PRT

<213> Clavularia species

<400> 4

```
Met Lys Cys Lys Phe Val Phe Cys Leu Ser Phe Leu Val Leu Ala Ile
 1          5          10          15
Thr Asn Ala Asn Ile Phe Leu Arg Asn Glu Ala Asp Leu Glu Glu Lys
 20          25          30
Thr Leu Arg Ile Pro Lys Ala Leu Thr Thr Met Gly Val Ile Lys Pro
 35          40          45
Asp Met Lys Ile Lys Leu Lys Met Glu Gly Asn Val Asn Gly His Ala
 50          55          60
Phe Val Ile Glu Gly Glu Gly Glu Gly Lys Pro Tyr Asp Gly Thr His
 65          70          75          80
Thr Leu Asn Leu Glu Val Lys Glu Gly Ala Pro Leu Pro Phe Ser Tyr
 85          90          95
Asp Ile Leu Ser Asn Ala Phe Gln Tyr Gly Asn Arg Ala Leu Thr Lys
100          105          110
Tyr Pro Asp Asp Ile Ala Asp Tyr Phe Lys Gln Ser Phe Pro Glu Gly
115          120          125
Tyr Ser Trp Glu Arg Thr Met Thr Phe Glu Asp Lys Gly Ile Val Lys
130          135          140
Val Lys Ser Asp Ile Ser Met Glu Glu Asp Ser Phe Ile Tyr Glu Ile
145          150          155          160
```

Arg	Phe	Asp	Gly	Met	Asn	Phe	Pro	Pro	Asn	Gly	Pro	Val	Met	Gln	Lys
				165					170					175	
Lys	Thr	Leu	Lys	Trp	Glu	Pro	Ser	Thr	Glu	Ile	Met	Tyr	Val	Arg	Asp
			180					185					190		
Gly	Val	Leu	Val	Gly	Asp	Ile	Ser	His	Ser	Leu	Leu	Leu	Glu	Gly	Gly
		195					200					205			
Gly	His	Tyr	Arg	Cys	Asp	Phe	Lys	Ser	Ile	Tyr	Lys	Ala	Lys	Lys	Val
	210					215					220				
Val	Lys	Leu	Pro	Asp	Tyr	His	Phe	Val	Asp	His	Arg	Ile	Glu	Ile	Leu
225					230					235					240
Asn	His	Asp	Lys	Asp	Tyr	Asn	Lys	Val	Thr	Leu	Tyr	Glu	Asn	Ala	Val
				245					250					255	
Ala	Arg	Tyr	Ser	Leu	Leu	Pro	Ser	Gln	Ala						
			260					265							

<210> 5
 <211> 693
 <212> DNA
 <213> Zoanthus species

<400> 5
 atggctcagt caaagcacgg tctaacaaaa gaaatgacaa tgaaataccg tatggaaggg 60
 tgcgtcgatg gacataaatt tgtgatcacg ggagagggca ttggatatcc gttcaaaggg 120
 aaacaggcta ttaatctgtg tgtggtcgaa ggtggaccat tgccatttgc cgaagacata 180
 ttgtcagctg cctttatgta cggaaacagg gttttcactg aatatacctca agacatagct 240
 gactatttca agaactcgtg tcctgctggt tatacatggg acaggtcttt tctctttgag 300
 gatggagcag tttgcatatg taatgcagat ataacagtga gtgttgaaga aaactgcatg 360
 tatcatgagt ccaaatttta tggagtgaat tttcctgctg atggacctgt gatgaaaaag 420
 atgacagata actgggagcc atcctgcgag aagatcatac cagtaccta gcaggggata 480
 ttgaaagggg atgtctccat gtacctcctt ctgaaggatg gtgggcgttt acggtgccaa 540
 ttcgacacag tttacaaagc aaagtctgtg ccaagaaaga tgccggactg gcacttcac 600
 cagcataagc tcacccgtga agaccgcagc gatgctaaga atcagaaatg gcacttgaca 660
 gaacatgcta ttgcatccgg atctgcattg ccc 693

<210> 6
 <211> 231
 <212> PRT
 <213> Zoanthus species

<400> 6
 Met Ala Gln Ser Lys His Gly Leu Thr Lys Glu Met Thr Met Lys Tyr
 1 5 10 15
 Arg Met Glu Gly Cys Val Asp Gly His Lys Phe Val Ile Thr Gly Glu
 20 25 30
 Gly Ile Gly Tyr Pro Phe Lys Gly Lys Gln Ala Ile Asn Leu Cys Val
 35 40 45
 Val Glu Gly Gly Pro Leu Pro Phe Ala Glu Asp Ile Leu Ser Ala Ala
 50 55 60
 Phe Asn Tyr Gly Asn Arg Val Phe Thr Glu Tyr Pro Gln Asp Ile Ala
 65 70 75 80

Asp	Tyr	Phe	Lys	Asn	Ser	Cys	Pro	Ala	Gly	Tyr	Thr	Trp	Asp	Arg	Ser			
				85					90					95				
Phe	Leu	Phe	Glu	Asp	Gly	Ala	Val	Cys	Ile	Cys	Asn	Ala	Asp	Ile	Thr			
			100					105					110					
Val	Ser	Val	Glu	Glu	Asn	Cys	Met	Tyr	His	Glu	Ser	Lys	Phe	Tyr	Gly			
			115				120					125						
Val	Asn	Phe	Pro	Ala	Asp	Gly	Pro	Val	Met	Lys	Lys	Met	Thr	Asp	Asn			
			130			135					140							
Trp	Glu	Pro	Ser	Cys	Glu	Lys	Ile	Ile	Pro	Val	Pro	Lys	Gln	Gly	Ile			
145					150					155					160			
Leu	Lys	Gly	Asp	Val	Ser	Met	Tyr	Leu	Leu	Leu	Lys	Asp	Gly	Gly	Arg			
			165					170					175					
Leu	Arg	Cys	Gln	Phe	Asp	Thr	Val	Tyr	Lys	Ala	Lys	Ser	Val	Pro	Arg			
			180					185					190					
Lys	Met	Pro	Asp	Trp	His	Phe	Ile	Gln	His	Lys	Leu	Thr	Arg	Glu	Asp			
		195				200						205						
Arg	Ser	Asp	Ala	Lys	Asn	Gln	Lys	Trp	His	Leu	Thr	Glu	His	Ala	Ile			
		210			215						220							
Ala	Ser	Gly	Ser	Ala	Leu	Pro												
225					230													

<210> 7
 <211> 865
 <212> DNA
 <213> Zoanthus species

<400> 7
 gagttgagtt tctcgacttc agttgtatca attttggggc atcaagcgat ctattttcaa 60
 catggctcat tcaaagcacg gtctaaaaga agaaatgaca atgaaatacc acatggaagg 120
 gtgcgctaac ggacataaat ttgtgatcac gggcgaaggc attggatatc cgttcaaagg 180
 gaaacagact attaattctgt gtgtgatcga agggggacca ttgccatttt ccgaagacat 240
 attgtcagct ggctttaagt acggagacag gatttttact gaatatcctc aagacatagt 300
 agactatttc aagaactcgt gtcctgctgg atatacatgg ggcaggtcct ttctctttga 360
 ggatggagca gtctgcatat gcaatgtaga tataacagtg agtgtcaaag aaaactgcat 420
 ttatcataag agcatattta atggaatgaa ttttcctgct gatggacctg tgatgaaaaa 480
 gatgacaact aactgggaag catcctgcga gaagatcatg ccagtaccta agcaggggat 540
 actgaaaggg gatgtctcca tgtacctcct tctgaaggat ggtgggcggt accggtgcca 600
 gttcgacaca gtttacaaag caaagtctgt gccaaagtaag atgccggagt ggcacttcat 660
 ccagcataag ctctccgtg aagaccgcag cgatgctaag aatcagaagt ggcagctgac 720
 agagcatgct attgcattcc cttctgcctt ggcctgataa gaatgtagtt ccaacatttt 780
 aatgcatgtg cttgtcaatt attctgataa aaatgtagtt gagttgaaaa cagacaagta 840
 caaataaagc acatgtaa at cgtct 865

<210> 8
 <211> 230
 <212> PRT
 <213> Zoanthus species

<400> 8
 Met Ala His Ser Lys His Gly Leu Lys Glu Glu Met Thr Met Lys Tyr

1	5	10	15
His Met Glu Gly Cys Val Asn Gly His Lys Phe Val Ile Thr Gly Glu			
20	25	30	
Gly Ile Gly Tyr Pro Phe Lys Gly Lys Gln Thr Ile Asn Leu Cys Val			
35	40	45	
Ile Glu Gly Gly Pro Leu Pro Phe Ser Glu Asp Ile Leu Ser Ala Gly			
50	55	60	
Phe Lys Tyr Gly Asp Arg Ile Phe Thr Glu Tyr Pro Gln Asp Ile Val			
65	70	75	80
Asp Tyr Phe Lys Asn Ser Cys Pro Ala Gly Tyr Thr Trp Gly Ser Phe			
85	90	95	
Leu Phe Glu Asp Gly Ala Val Cys Ile Cys Asn Val Asp Ile Thr Val			
100	105	110	
Ser Val Lys Glu Asn Cys Ile Tyr His Lys Ser Ile Phe Asn Gly Met			
115	120	125	
Asn Phe Pro Ala Asp Gly Pro Val Met Lys Lys Met Thr Thr Asn Trp			
130	135	140	
Glu Ala Ser Cys Glu Lys Ile Met Pro Val Pro Lys Gln Gly Ile Leu			
145	150	155	160
Lys Gly Asp Val Ser Met Tyr Leu Leu Leu Lys Asp Gly Gly Arg Tyr			
165	170	175	
Arg Cys Gln Phe Asp Thr Val Tyr Lys Ala Lys Ser Val Pro Ser Lys			
180	185	190	
Met Pro Glu Trp His Phe Ile Gln His Lys Leu Leu Arg Glu Asp Arg			
195	200	205	
Ser Asp Ala Lys Asn Gln Lys Trp Gln Leu Thr Glu His Ala Ile Ala			
210	215	220	
Phe Pro Ser Ala Leu Ala			
225	230		

<210> 9
 <211> 850
 <212> DNA
 <213> Disosoma striata

<400> 9
 acggtcaggg acacggtgac ccacttttgggt attctaacaa aatgagttgg tccaagagtg 60
 tgatcaagga agaaatgttg atcgatcttc atctggaagg aacgttcaat gggcactact 120
 ttgaaataaa aggcaaagga aaagggaagc ctaatgaagg caccaataacc gtcacgctcg 180
 aggttaccaa ggggtggacct ctgccatttg gttggcatat tttgtgcca caatttcagt 240
 atggaaacaa ggcattttgtc caccaccctg acgacatacc tgattatcta aagctgtcat 300
 ttccggaggg atatacatgg gaacggtcca tgcactttga agacggtggc ttgtgttgta 360
 tcaccaatga tatcagtttg acaggcaact gtttcaacta cgacatcaag ttcactggct 420
 tgaactttcc tccaaatgga cccgttgtgc agaagaagac aactggctgg gaaccgagca 480
 ctgagcgttt gtatcctcgt gatggcgtgt tgataggaga catccatcat gctctcacag 540
 tggaaggagg tggtcattac gtatgtgaca ttaaaactgt ttacagggcc aagaagccc 600
 taaagatgcc aggttatcac tatgttgaca ccaaactggt tataaggagc aacgacaaag 660
 aattcatgaa agttgaggag catgaaatcg ccgttgcacg ccaccatccg ctccaaagcc 720
 aatgaagctt aagtaaagca aaaagggtgac gaggcgatgat agtatgacat gatagtatga 780
 catgatagta tgacatgata gtaagaattg taagcaaaag gctttgctta ttaaacttgt 840

aattgaaaac

850

<210> 10
<211> 227
<212> PRT
<213> Discosoma striata

<400> 10
Met Ser Trp Ser Lys Ser Val Ile Lys Glu Glu Met Leu Ile Asp Leu
1 5 10 15
His Leu Glu Gly Thr Phe Asn Gly His Tyr Phe Glu Ile Lys Gly Lys
20 25 30
Gly Lys Gly Lys Pro Asn Glu Gly Thr Asn Thr Val Thr Leu Glu Val
35 40 45
Thr Lys Gly Gly Pro Leu Pro Phe Gly Trp His Ile Leu Cys Pro Gln
50 55 60
Phe Gln Tyr Gly Asn Lys Ala Phe Val His His Pro Asp Asp Ile Pro
65 70 75 80
Asp Tyr Leu Lys Leu Ser Phe Pro Glu Gly Tyr Thr Trp Glu Arg Ser
85 90 95
Met His Phe Glu Asp Gly Gly Leu Cys Cys Ile Thr Asn Asp Ile Ser
100 105 110
Leu Thr Gly Asn Cys Phe Asn Tyr Asp Ile Lys Phe Thr Gly Leu Asn
115 120 125
Phe Pro Pro Asn Gly Pro Val Val Gln Lys Lys Thr Thr Gly Trp Glu
130 135 140
Pro Ser Thr Glu Arg Leu Tyr Pro Arg Asp Gly Val Leu Ile Gly Asp
145 150 155 160
Ile His His Ala Leu Thr Val Glu Gly Gly Gly His Tyr Val Cys Asp
165 170 175
Ile Lys Thr Val Tyr Arg Ala Lys Lys Pro Val Lys Met Pro Gly Tyr
180 185 190
His Tyr Val Asp Thr Lys Leu Val Ile Arg Ser Asn Asp Lys Glu Phe
195 200 205
Met Lys Val Glu Glu His Glu Ile Ala Val Ala Arg His His Pro Leu
210 215 220
Gln Ser Gln
225

<210> 11
<211> 678
<212> DNA
<213> Discosoma species

<400> 11
atgaggtcctt ccaagaatgt tatcaaggag ttcattgaggt ttaagggttcg catggaagga 60
acggtcaatg ggcacgagtt tgaaatagaa ggcgaaggag aggggaggcc atacgaaggc 120
cacaataccg taaagcttaa ggtaaccaag gggggacctt tgccatttgc ttgggatatt 180
ttgtcaccac aatttcagta tggaagcaag gtatatgtca agcaccctgc cgacatacca 240
gactataaaa agctgtcatt tcctgaagga tttaaattggg aaagggtcat gaactttgaa 300

gacggtggcg tcgttactgt aacccaggat tccagtttgc aggatggctg tttcatctac 360
aaggtcaagt tcattggcgt gaactttcct tccgatggac ctgttatgca aaagaagaca 420
atgggctggg aagccagcac tgagcgtttg taccctcgtg atggcgtgtt gaaaggagag 480
attcataagg ctctgaagct gaaagacggt ggtcattacc tagttgaatt caaaagtatt 540
tacatggcaa agaagcctgt gcagctacca ggggtactact atgttgactc caaactggat 600
ataacaagcc acaacgaaga ctatacaatc gttgagcagt atgaaagaac cgaggggacgc 660
caccatctgt tcctttaa 678

<210> 12

<211> 225

<212> PRT

<213> Discosoma species

<400> 12

Met	Arg	Ser	Ser	Lys	Asn	Val	Ile	Lys	Glu	Phe	Met	Arg	Phe	Lys	Val
1				5					10					15	
Arg	Met	Glu	Gly	Thr	Val	Asn	Gly	His	Glu	Phe	Glu	Ile	Glu	Gly	Glu
			20					25					30		
Gly	Glu	Gly	Arg	Pro	Tyr	Glu	Gly	His	Asn	Thr	Val	Lys	Leu	Lys	Val
		35					40					45			
Thr	Lys	Gly	Gly	Pro	Leu	Pro	Phe	Ala	Trp	Asp	Ile	Leu	Ser	Pro	Gln
	50					55					60				
Phe	Gln	Tyr	Gly	Ser	Lys	Val	Tyr	Val	Lys	His	Pro	Ala	Asp	Ile	Pro
65					70					75					80
Asp	Tyr	Lys	Lys	Leu	Ser	Phe	Pro	Glu	Gly	Phe	Lys	Trp	Glu	Arg	Val
				85					90				95		
Met	Asn	Phe	Glu	Asp	Gly	Gly	Val	Val	Thr	Val	Thr	Gln	Asp	Ser	Ser
			100					105					110		
Leu	Gln	Asp	Gly	Cys	Phe	Ile	Tyr	Lys	Val	Lys	Phe	Ile	Gly	Val	Asn
		115					120					125			
Phe	Pro	Ser	Asp	Gly	Pro	Val	Met	Gln	Lys	Lys	Thr	Met	Gly	Trp	Glu
	130					135						140			
Ala	Ser	Thr	Glu	Arg	Leu	Tyr	Pro	Arg	Asp	Gly	Val	Leu	Lys	Gly	Glu
145					150					155					160
Ile	His	Lys	Ala	Leu	Lys	Leu	Lys	Asp	Gly	Gly	His	Tyr	Leu	Val	Glu
				165					170					175	
Phe	Lys	Ser	Ile	Tyr	Met	Ala	Lys	Lys	Pro	Val	Gln	Leu	Pro	Gly	Tyr
			180					185					190		
Tyr	Tyr	Val	Asp	Ser	Lys	Leu	Asp	Ile	Thr	Ser	His	Asn	Glu	Asp	Tyr
		195					200					205			
Thr	Ile	Val	Glu	Gln	Tyr	Glu	Arg	Thr	Glu	Gly	Arg	His	His	Leu	Phe
	210					215					220				
Leu															
225															

<210> 13

<211> 696

<212> DNA

<213> Anemonia sulcata

<400> 13

```
atggcttcct ttttaaagaa gactatgccc ttttaagacga ccattgaagg gacggttaat 60
ggccactact tcaagtgtac aggaaaagga gagggcaacc catttgaggg tacgcaggaa 120
atgaagatag aggtcatcga aggaggtcca ttgccatttg ccttccacat tttgtcaacg 180
agttgtatgt acggtagtaa ggccttcacg aagtatgtgt caggaattcc tgactacttc 240
aagcagtcct tccctgaagg ttttacttgg gaaagaacca caacctacga ggatggaggc 300
tttcttacag ctcacacagga cacaagccta gatggagatt gcctcgttta caaggccaag 360
attcttggtg ataattttcc tgctgatggc cccgtgatgc agaacaagc aggaagatgg 420
gagccatcca ccgagatagt ttatgaagtt gacgggtgtc tgcgtggaca gtctttgatg 480
gcccttaagt gccctggtgg tcgtcatctg acttgccatc tccatactac ttacagggtc 540
aaaaaaccag ctgctgcctt gaagatgccg ggatttcatt ttgaagatca tcgcatcgag 600
ataatggagg aagttgagaa aggcaagtgc tataaacagt acgaagcagc agtgggcagg 660
tactgtgatg ctgctccatc caagcttggg cataac 696
```

<210> 14

<211> 232

<212> PRT

<213> Anemonia sulcata

<400> 14

```
Met Ala Ser Phe Leu Lys Lys Thr Met Pro Phe Lys Thr Thr Ile Glu
 1          5          10          15
Gly Thr Val Asn Gly His Tyr Phe Lys Cys Thr Gly Lys Gly Glu Gly
 20          25          30
Asn Pro Phe Glu Gly Thr Gln Glu Met Lys Ile Glu Val Ile Glu Gly
 35          40          45
Gly Pro Leu Pro Phe Ala Phe His Ile Leu Ser Thr Ser Cys Met Tyr
 50          55          60
Gly Ser Lys Thr Phe Ile Lys Tyr Val Ser Gly Ile Pro Asp Tyr Phe
 65          70          75          80
Lys Gln Ser Phe Pro Glu Gly Phe Thr Trp Glu Arg Thr Thr Thr Tyr
 85          90          95
Glu Asp Gly Gly Phe Leu Thr Ala His Gln Asp Thr Ser Leu Asp Gly
100          105          110
Asp Cys Leu Val Tyr Lys Val Lys Ile Leu Gly Asn Asn Phe Pro Ala
115          120          125
Asp Gly Pro Val Met Gln Asn Lys Ala Gly Arg Trp Glu Pro Ala Thr
130          135          140
Glu Ile Val Tyr Glu Val Asp Gly Val Leu Arg Gly Gln Ser Leu Met
145          150          155          160
Ala Leu Lys Cys Pro Gly Gly Arg His Leu Thr Cys His Leu His Thr
165          170          175
Thr Tyr Arg Ser Lys Lys Pro Ala Ala Ala Leu Lys Met Pro Gly Phe
180          185          190
His Phe Glu Asp His Arg Ile Glu Ile Met Glu Glu Val Glu Lys Gly
195          200          205
Lys Cys Tyr Lys Gln Tyr Glu Ala Ala Val Gly Arg Tyr Cys Asp Ala
210          215          220
Ala Pro Ser Lys Leu Gly His Asn
225          230
```

<210> 15
 <211> 919
 <212> DNA
 <213> Discosoma species

<400> 15
 attcacctcg gtgatttgta agagaaagga tcaccatcaa gagaagagct gtaaaagtta 60
 atattttact gtactttctac cagcatgagt gcacttaaag aagaaatgaa aatcaacctt 120
 acaatggaag gtgttggttaa cgggcttcca tttaagatcc gtggggatgg aaaaggcaaa 180
 ccataccagg gatcacagga gttaaccttg acggtgggta aaggcgggcc tctgcctttc 240
 tcttatgata ttctgacaac gatgtttcag tacggcaaca gggcattcgt aaactaccca 300
 gaggacatac cagatatattt caagcagacc tgttctgggc ctaatgggtg atattcctgg 360
 caaaggacca tgacttatga agacggaggc gtttgcactg ctacaagcaa catcagcgtg 420
 gttggcgaca ctttcaatta tgacattcac tttatgggag cgaattttcc tcttgatggg 480
 ccagtgatgc agaaaagaac aatgaaatgg gaaccatcca ctgagataat gtttgaacgt 540
 gatggaatgc tgaggggtga cattgccatg tctctgttgc tgaagggagg gggccattac 600
 cgatgtgatt ttgaaactat ttataaaccc aataagggtg tcaagatgcc agattaccat 660
 tttgtggacc actgcattga gataacgagt caacaggatt attacaacgt ggttgagctg 720
 accgaggttg ctgaagcccg ctactcttcg ctggagaaaa tcggcaaatac aaaggcgtaa 780
 atccaagcaa tctaagaaaa caacaaggca ttaaaccgaa tcaccgtttt gaatttttcg 840
 ttcggaattt cttggtaaaa ctaggttttag aacgtttcat ttcgctggac ttctttgact 900
 cagctgtaga caagaaaga 919

<210> 16
 <211> 231
 <212> PRT
 <213> Discosoma species

<400> 16
 Met Ser Ala Leu Lys Glu Glu Met Lys Ile Asn Leu Thr Met Glu Gly
 1 5 10 15
 Val Val Asn Gly Leu Pro Phe Lys Ile Arg Gly Asp Gly Lys Gly Lys
 20 25 30
 Pro Tyr Gln Gly Ser Gln Glu Leu Thr Leu Thr Val Val Lys Gly Gly
 35 40 45
 Pro Leu Pro Phe Ser Tyr Asp Ile Leu Thr Thr Met Phe Gln Tyr Gly
 50 55 60
 Asn Arg Ala Phe Val Asn Tyr Pro Glu Asp Ile Pro Asp Ile Phe Lys
 65 70 75 80
 Gln Thr Cys Ser Gly Pro Asn Gly Gly Tyr Ser Trp Gln Arg Thr Met
 85 90 95
 Thr Tyr Glu Asp Gly Gly Val Cys Thr Ala Thr Ser Asn Ile Ser Val
 100 105 110
 Val Gly Asp Thr Phe Asn Tyr Asp Ile His Phe Met Gly Ala Asn Phe
 115 120 125
 Pro Leu Asp Gly Pro Val Met Gln Lys Arg Thr Met Lys Trp Glu Pro
 130 135 140
 Ser Thr Glu Ile Met Phe Glu Arg Asp Gly Met Leu Arg Gly Asp Ile
 145 150 155 160
 Ala Met Ser Leu Leu Lys Gly Gly Gly His Tyr Arg Cys Asp Phe
 165 170 175

Glu	Thr	Ile	Tyr	Lys	Pro	Asn	Lys	Val	Val	Lys	Met	Pro	Asp	Tyr	His
			180					185					190		
Phe	Val	Asp	His	Cys	Ile	Glu	Ile	Thr	Ser	Gln	Gln	Asp	Tyr	Tyr	Asn
		195					200					205			
Val	Val	Glu	Leu	Thr	Glu	Val	Ala	Glu	Ala	Arg	Tyr	Ser	Ser	Leu	Glu
	210					215					220				
Lys	Ile	Gly	Lys	Ser	Lys	Ala									
225					230										

<210> 17
 <211> 876
 <212> DNA
 <213> Discosoma species

<400> 17
 agtttcagcc agtgacaggg tgagctgcca ggtattctaa caagatgagt tgttccaaga 60
 atgtgatcaa ggagttcatg aggttcaagg ttcgtatgga aggaacgggc aatgggcacg 120
 agtttgaaat aaaaggcgaa ggtgaagggg ggccttacga aggtcactgt tccgtaaagc 180
 ttatggtaac caaggggtga cctttgccat ttgcttttga tattttgtca ccacaatttc 240
 agtatggaag caaggtatat gtcaaaccac ctgccgacat accagactat aaaaagctgt 300
 catttcctga gggatttaaa tgggaaaggg tcatgaactt tgaagacggg ggcgtgggta 360
 ctgtatccca agattccagt ttgaaagacg gctgtttcat ctacgagggt aagttcattg 420
 ggggtgaactt tccttctgat ggacctgtta tgcagaggag gacacggggc tgggaagcca 480
 gctctgagcg tttgtatcct cgtgatgggg tgctgaaagg agacatccat atggctctga 540
 ggctggaagg aggcggccat tacctcgttg aattcaaaag tatttacatg gtaaagaagc 600
 cttcagtga gttgccaggg tactattatg ttgactccaa actggatatg acgagccaca 660
 acgaagatta cacagtcgtt gagcagtatg aaaaaaccca gggacgccac catccgttca 720
 ttaagcctct gcagtgaact cggctcagtc atggattagc ggtaatggcc acaaaaggca 780
 cgatgatcgt tttttaggaa tgcagccaaa aattgaaggt tatgacagta gaaatacaag 840
 caacaggctt tgcttattaa acatgtaatt gaaaac 876

<210> 18
 <211> 230
 <212> PRT
 <213> Discosoma species

<400> 18
 Met Ser Cys Ser Lys Asn Val Ile Lys Glu Phe Met Arg Phe Lys Val
 1 5 10 15
 Arg Met Glu Gly Thr Val Asn Gly His Glu Phe Glu Ile Lys Gly Glu
 20 25 30
 Gly Glu Gly Arg Pro Tyr Glu Gly His Cys Ser Val Lys Leu Met Val
 35 40 45
 Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Leu Ser Pro Gln
 50 55 60
 Phe Gln Tyr Gly Ser Lys Val Tyr Val Lys His Pro Ala Asp Ile Pro
 65 70 75 80
 Asp Tyr Lys Lys Leu Ser Phe Pro Glu Gly Phe Lys Trp Glu Arg Val
 85 90 95
 Met Asn Phe Glu Asp Gly Gly Val Val Thr Val Ser Gln Asp Ser Ser

				100					105					110				
Leu	Lys	Asp	Gly	Cys	Phe	Ile	Tyr	Glu	Val	Lys	Phe	Ile	Gly	Val	Asn			
		115						120					125					
Phe	Pro	Ser	Asp	Gly	Pro	Val	Met	Gln	Arg	Arg	Thr	Arg	Gly	Trp	Glu			
	130					135					140							
Ala	Ser	Ser	Glu	Arg	Leu	Tyr	Pro	Arg	Asp	Gly	Val	Leu	Lys	Gly	Asp			
145					150					155					160			
Ile	His	Met	Ala	Leu	Arg	Leu	Glu	Gly	Gly	Gly	His	Tyr	Leu	Val	Glu			
			165					170						175				
Phe	Lys	Ser	Ile	Tyr	Met	Val	Lys	Lys	Pro	Ser	Val	Gln	Leu	Pro	Gly			
		180						185					190					
Tyr	Tyr	Tyr	Val	Asp	Ser	Lys	Leu	Asp	Met	Thr	Ser	His	Asn	Glu	Asp			
		195					200						205					
Tyr	Thr	Val	Val	Glu	Gln	Tyr	Glu	Lys	Thr	Gln	Gly	Arg	His	His	Pro			
	210					215					220							
Phe	Ile	Lys	Pro	Leu	Gln													
225					230													

<210> 19
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 19
 atgtgcaata ccaacatgtc tgtacc

26

<210> 20
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 20
 ctaggggaaa taagttagca c

21

<210> 21
 <211> 41
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Primer

<400> 21
 ggaattccag ccatggtgtg caataccaac atgtctgtac c

41

<210> 22
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 22
tcccccgggg ggaaataagt tagcac

26

<210> 23
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 23
acatggatcc aggtcttcca agaatttat c

31

<210> 24
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 24
tagtactcga gccaaagttca gcctta

26

<210> 25
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 25
acatggatcc agttgttcca agaattgat

30

<210> 26
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 26
tagtactcga ggccattacc gctaatac

27

<210> 27
<211> 690
<212> DNA
<213> Anemonia majano

<400> 27
atggccctgt ccaacgagtt catcggcgac gacatgaaga tgacctacca catggacggc 60
tgcgtgaacg gccactactt caccgtgaag ggcgagggca gcggaagcc ctacgagggc 120
accagacct ccaccttcaa ggtgaccatg gccaacggcg gccccctggc cttctccttc 180
gacatcctgt ccacgtgtt catgtacggc aaccgtctgt tcaccgccta cccaccagc 240
atgcccgaact acttcaagca ggccttcccc gacggcatgt cctacgagag aaccttcacc 300
tacgaggacg gcggcgtggc caccgccagc tgggagatca gcctgaaggg caactgcttc 360
gagcacaagt ccaccttcca cggcgtgaac ttccccgccg acggccccgt gatggccaag 420
aagaccaccg gctgggaccc ctcttcgag aagatgaccg tgtgcgacgg catcttgaag 480
ggcgacgtga ccgccttcct gatgctgcag ggcggcggca actacagatg ccagttccac 540
acctctaca agaccaagaa gcccgtagcc atgcccccca accacgtggt ggagcaccgc 600
atcgccagaa ccgacctgga caagggcggc aacagcgtgc agctgaccga gcacgccgtg 660
gccacatca cctccgtggt gcccttctga 690

<210> 28
<211> 229
<212> PRT
<213> Anemonia majano

<400> 28
Met Ala Leu Ser Asn Glu Phe Ile Gly Asp Asp Met Lys Met Thr Tyr
1 5 10 15
His Met Asp Gly Cys Val Asn Gly His Tyr Phe Thr Val Lys Gly Glu
20 25 30
Gly Ser Gly Lys Pro Tyr Glu Gly Thr Gln Thr Ser Thr Phe Lys Val
35 40 45
Thr Met Ala Asn Gly Gly Pro Leu Ala Phe Ser Phe Asp Ile Leu Ser
50 55 60
Thr Val Phe Met Tyr Gly Asn Arg Cys Phe Thr Ala Tyr Pro Thr Ser
65 70 75 80
Met Pro Asp Tyr Phe Lys Gln Ala Phe Pro Asp Gly Met Ser Tyr Glu
85 90 95
Arg Thr Phe Thr Tyr Glu Asp Gly Gly Val Ala Thr Ala Ser Trp Glu
100 105 110
Ile Ser Leu Lys Gly Asn Cys Phe Glu His Lys Ser Thr Phe His Gly
115 120 125
Val Asn Phe Pro Ala Asp Gly Pro Val Met Ala Lys Lys Thr Thr Gly
130 135 140
Trp Asp Pro Ser Phe Glu Lys Met Thr Val Cys Asp Gly Ile Leu Lys
145 150 155 160
Gly Asp Val Thr Ala Phe Leu Met Leu Gln Gly Gly Gly Asn Tyr Arg
165 170 175
Cys Gln Phe His Thr Ser Tyr Lys Thr Lys Lys Pro Val Thr Met Pro

			180					185					190						
Pro	Asn	His	Val	Val	Glu	His	Arg	Ile	Ala	Arg	Thr	Asp	Leu	Asp	Lys				
			195					200					205						
Gly	Gly	Asn	Ser	Val	Gln	Leu	Thr	Glu	His	Ala	Val	Ala	His	Ile	Thr				
		210				215						220							
Ser	Val	Val	Pro	Phe															
225																			

<210> 29
 <211> 705
 <212> DNA
 <213> Zoanthus species

<400> 29
 ggatccgctc agtcagagca cggctctaaca gaagaaatga caatgaaata ccgtatggaa 60
 ggggtgcgtcg atggacataa atttgtgatc acgggagagg gcattggata tccgttcaaa 120
 gggaaacagg ctattaatct gtgtgtgggc gaaggtggac cattgccatt tgccgaagac 180
 atattgtcag ctgcctttat gtacggaaac agggttttca ctgaatatcc tcaagacata 240
 gttgactatt tcaagaactc gtgtcctgct ggatatacat gggacaggtc ttttctcttt 300
 gaggatggag cagtttgcac atgtaatgca gatataacag tgagtgttga agaaaactgc 360
 atgtatcatg agtccaaatt ctatggagtg aattttcctg ctgatggacc tgtgatgaaa 420
 aagatgacag ataactggga gccatcctgc gagaagatca taccagtacc taagcagggg 480
 atattgaaag gggatgtctc catgtacctc cttctgaagg atgggtgggcg tttacgggtgc 540
 caattcgaca cagttttacaa agcaaagtct gtgccaagaa agatgccgga ctggcacttc 600
 atccagcata agctcaccgc tgaagaccgc agcgatgcta agaatcagaa atggcatctg 660
 acagaacatg ctattgcatc cggatctgca ttgcctgaa agctt 705

<210> 30
 <211> 230
 <212> PRT
 <213> Zoanthus species

<400> 30
 Ala Gln Ser Glu His Gly Leu Thr Glu Glu Met Thr Met Lys Tyr Arg
 1 5 10 15
 Met Glu Gly Cys Val Asp Gly His Lys Phe Val Ile Thr Gly Glu Gly
 20 25 30
 Ile Gly Tyr Pro Phe Lys Gly Lys Gln Ala Ile Asn Leu Cys Val Val
 35 40 45
 Glu Gly Gly Pro Leu Pro Phe Ala Glu Asp Ile Leu Ser Ala Ala Phe
 50 55 60
 Met Tyr Gly Asn Arg Val Phe Thr Glu Tyr Pro Gln Asp Ile Val Asp
 65 70 75 80
 Tyr Phe Lys Asn Ser Cys Pro Ala Gly Tyr Thr Trp Asp Arg Ser Phe
 85 90 95
 Leu Phe Glu Asp Gly Ala Val Cys Ile Cys Asn Ala Asp Ile Thr Val
 100 105 110
 Ser Val Glu Glu Asn Cys Met Tyr His Glu Ser Lys Phe Tyr Gly Val
 115 120 125
 Asn Phe Pro Ala Asp Gly Pro Val Met Lys Lys Met Thr Asp Asn Trp

130		135		140
Glu Pro Ser Cys Glu Lys	Ile Ile Pro Val Pro Lys Gln Gly Ile Leu			
145	150	155		160
Lys Gly Asp Val Ser Met Tyr Leu Leu Leu Lys Asp Gly Gly Arg Leu				
	165	170		175
Arg Cys Gln Phe Asp Thr Val Tyr Lys Ala Lys Ser Val Pro Arg Lys				
	180	185		190
Met Pro Asp Trp His Phe Ile Gln His Lys Leu Thr Arg Glu Asp Arg				
	195	200		205
Ser Asp Ala Lys Asn Gln Lys Trp His Leu Thr Glu His Ala Ile Ala				
	210	215		220
Ser Gly Ser Ala Leu Pro				
225	230			

<210> 31
 <211> 231
 <212> PRT
 <213> Zoanthus species

<400> 31
Met Ala Gln Ser Lys His Gly Leu Thr Lys Glu Met Thr Met Lys Tyr
1 5 10 15
Arg Met Glu Gly Cys Val Asp Gly His Lys Phe Val Ile Thr Gly Glu
20 25 30
Gly Ile Gly Tyr Pro Phe Lys Gly Lys Gln Ala Ile Asn Leu Cys Val
35 40 45
Val Glu Gly Gly Pro Leu Pro Phe Ala Glu Asp Ile Leu Ser Ala Gly
50 55 60
Phe Lys Tyr Gly Asp Arg Val Phe Thr Glu Tyr Pro Gln Asp Ile Val
65 70 75 80
Asp Tyr Phe Lys Asn Ser Cys Pro Ala Gly Tyr Thr Trp Asp Arg Ser
85 90 95
Phe Leu Phe Glu Asp Gly Ala Val Cys Ile Cys Asn Ala Asp Ile Thr
100 105 110
Val Ser Val Glu Glu Asn Cys Met Tyr His Glu Ser Lys Phe Tyr Gly
115 120 125
Val Asn Phe Pro Ala Asp Gly Pro Val Met Lys Lys Met Thr Asp Asn
130 135 140
Trp Glu Pro Ser Cys Glu Lys Ile Ile Pro Val Pro Lys Gln Gly Ile
145 150 155 160
Leu Lys Gly Asp Val Ser Met Tyr Leu Leu Leu Lys Asp Gly Gly Arg
165 170 175
Leu Arg Cys Gln Phe Asp Thr Val Tyr Lys Ala Lys Ser Val Pro Arg
180 185 190
Lys Met Pro Asp Trp His Phe Ile Gln His Lys Leu Thr Arg Glu Asp
195 200 205
Arg Ser Asp Ala Lys Asn Gln Lys Trp His Leu Thr Glu His Ala Ile
210 215 220
Ala Ser Gly Ser Ala Leu Pro
225 230

<210> 32
 <211> 231
 <212> PRT
 <213> Zoanthus species

<400> 32
 Met Ala Gln Ser Lys His Gly Leu Thr Lys Glu Met Thr Met Lys Tyr
 1 5 10 15
 Arg Met Glu Gly Cys Val Asp Gly His Lys Phe Val Ile Thr Gly Glu
 20 25 30
 Gly Ile Gly Tyr Pro Phe Lys Gly Lys Gln Ala Ile Asn Leu Cys Val
 35 40 45
 Val Glu Gly Gly Pro Leu Pro Phe Ala Glu Asp Ile Leu Ser Ala Gly
 50 55 60
 Phe Lys Tyr Gly Asp Arg Val Phe Thr Glu Tyr Pro Gln Asp Ile Val
 65 70 75 80
 Asp Tyr Phe Lys Asn Ser Cys Pro Ala Gly Tyr Thr Trp Asn Arg Ser
 85 90 95
 Phe Leu Phe Glu Asp Gly Ala Val Cys Ile Cys Asn Ala Asp Ile Thr
 100 105 110
 Val Ser Val Glu Glu Asn Cys Val Tyr His Glu Ser Lys Phe Tyr Gly
 115 120 125
 Val Asn Phe Pro Ala Asp Gly Pro Val Met Lys Lys Met Thr Asp Asn
 130 135 140
 Trp Glu Pro Ser Cys Glu Lys Ile Ile Pro Val Pro Arg Gln Gly Ile
 145 150 155 160
 Leu Lys Gly Asp Val Ser Met Tyr Leu Leu Leu Lys Asp Gly Gly Arg
 165 170 175
 Leu Arg Cys Gln Phe Asp Thr Val Tyr Lys Ala Lys Ser Val Pro Arg
 180 185 190
 Lys Met Pro Asp Trp His Phe Ile Gln His Lys Leu Thr Arg Glu Asp
 195 200 205
 Arg Ser Asp Ala Lys Asn Gln Lys Trp His Leu Thr Glu His Ala Ile
 210 215 220
 Ala Ser Gly Ser Ala Leu Ser
 225 230

<210> 33
 <211> 657
 <212> DNA
 <213> Zoanthus species

<400> 33
 taccacatgg agggctgcgt gaacggccac aagttcgtga tcaccggcga gggcatcggc 60
 tacccttca agggcaagca gaccatcaac ctgtgcgtga tcgagggcgg cccctgccc 120
 ttcagcgagg acatcctgag cgccggcttc aagtacggcg accggatctt caccgagtac 180
 cccagagaca tcgtggacta cttcaagaac agctgccccg ccggctacac ctggggccgg 240
 agcttcctgt tcgaggacgg cgccgtgtgc atctgtaacg tggacatcac cgtgagcgtg 300
 aaggagaact gcatctacca caagagcatc ttcaacggcg tgaacttccc cgccgacggc 360

cccgtgatga agaagatgac caccaactgg gaggccagct gcgagaagat catgcccgtg 420
 cctaagcagg gcatcctgaa gggcgacgtg agcatgtacc tgctgctgaa ggacggcggc 480
 cggtagcggg gccagttcga caccgtgtac aaggccaaga gcgtgcccag caagatgccc 540
 gagtggcact tcatccagca caagctgctg cgggaggacc ggagcgacgc caagaaccag 600
 aagtggcagc tgaccgagca cgccatcgcc ttccccagcg ccctggcctg aaagctt 657

<210> 34

<211> 230

<212> PRT

<213> Zoanthus species

<400> 34

Ala	His	Ser	Glu	His	Gly	Leu	Thr	Glu	Glu	Met	Thr	Met	Lys	Tyr	His
1				5				10						15	
Met	Glu	Gly	Cys	Val	Asn	Gly	His	Lys	Phe	Val	Ile	Thr	Gly	Glu	Gly
			20					25					30		
Ile	Gly	Tyr	Pro	Phe	Lys	Gly	Lys	Gln	Thr	Ile	Asn	Leu	Cys	Val	Ile
		35					40					45			
Glu	Gly	Gly	Pro	Leu	Pro	Phe	Ser	Glu	Asp	Ile	Leu	Ser	Ala	Gly	Phe
	50					55					60				
Lys	Tyr	Gly	Asp	Arg	Ile	Phe	Thr	Glu	Tyr	Pro	Gln	Asp	Ile	Val	Asp
65					70					75					80
Tyr	Phe	Lys	Asn	Ser	Cys	Pro	Ala	Gly	Tyr	Thr	Trp	Gly	Arg	Ser	Phe
			85						90					95	
Leu	Phe	Glu	Asp	Gly	Ala	Val	Cys	Ile	Cys	Asn	Val	Asp	Ile	Thr	Val
			100					105					110		
Ser	Val	Lys	Glu	Asn	Cys	Ile	Tyr	His	Lys	Ser	Ile	Phe	Asn	Gly	Val
		115					120					125			
Asn	Phe	Pro	Ala	Asp	Gly	Pro	Val	Met	Lys	Lys	Met	Thr	Thr	Asn	Trp
	130					135					140				
Glu	Ala	Ser	Cys	Glu	Lys	Ile	Met	Pro	Val	Pro	Lys	Gln	Gly	Ile	Leu
145					150					155					160
Lys	Gly	Asp	Val	Ser	Met	Tyr	Leu	Leu	Leu	Lys	Asp	Gly	Gly	Arg	Tyr
			165						170					175	
Arg	Cys	Gln	Phe	Asp	Thr	Val	Tyr	Lys	Ala	Lys	Ser	Val	Pro	Ser	Lys
		180					185					190			
Met	Pro	Glu	Trp	His	Phe	Ile	Gln	His	Lys	Leu	Leu	Arg	Glu	Asp	Arg
		195					200					205			
Ser	Asp	Ala	Lys	Asn	Gln	Lys	Trp	Gln	Leu	Thr	Glu	His	Ala	Ile	Ala
	210					215					220				
Phe	Pro	Ser	Ala	Leu	Ala										
225					230										

<210> 35

<211> 681

<212> DNA

<213> Discosoma species

<400> 35

atggtgctgct cctccaagaa cgatcatcaag gagttcatgc gcttcaaggt gcgcatggag 60

```

ggcaccgtga acggccacga gttcgagatc gagggcgagg gcgagggccg cccctacgag 120
ggccacaaca ccgtgaagct gaaggtgacc aagggcgggc ccctgccctt cgcctgggac 180
atcctgtccc cccagttcca gtacggctcc aaggtgtacg tgaagcacc cgcgcacatc 240
cccgactaca agaagctgtc cttccccgag ggcttcaagt gggagcgcgat gatgaacttc 300
gaggacggcg gcgtggcgac cgtgacccaa gactcctccc tgcaggacgg ctgcttcac 360
tacaaggtga agttcatcgg cgtgaacttc ccctccgacg gccccgtaat gcagaagaag 420
accatgggct gggaggcctc caccgagcgc ctgtaccccc gcgacggcgt gctgaagggc 480
gagatccaca aggccctgaa gctgaaggac ggcggccact acctgggtgga gttcaagtcc 540
atctacatgg ccaagaagcc cgtgcagctg cccggctact actacgtgga ctccaagctg 600
gacatcacct cccacaacga ggactacacc atcgtggagc agtacgagcg caccgagggc 660
cgccaccacc tgttcctgta g 681

```

<210> 36

<211> 678

<212> DNA

<213> Discosoma species

<400> 36

```

atggcctcct ccgagaacgt catcaccgag ttcattgcgt tcaaggtgcg catggagggc 60
accgtgaacg gccacgagtt cgagatcgag ggcgagggcg agggccgccc ctacgagggc 120
cacaacaccg tgaagttgaa ggtgaccaag ggcggccccc tgccttcgc ctgggacatc 180
ctgtcccccc agttccagta cggctccaag gtgtacgtga agcaccgccg cgacatcccc 240
gactacaaga agctgtcctt ccccgagggc ttcaagtggg agcgcgatgat gaacttcgag 300
gacggcgggc tggcgaccgt gacccaggac tcctccctgc aggacggctg cttcatctac 360
aaggtgaagt tcacggcgt gaacttcccc tccgacggcc ccgtgatgca gaagaagacc 420
atgggctggg aggcctccac cgagcgctg taccgccgcg acggcgctgt gaagggcgag 480
atccacaagg ccctgaagct gaaggacggc ggccactacc tgggtggagtt caagtccatc 540
tacatggcca agaagcccg gtagctgccc ggctactact acgtggacac caagtggac 600
atcacctccc acaacgagga ctacaccatc gtggagcagt acgagcgcac cgagggccgc 660
caccacctgt tcctgtaa 678

```

<210> 37

<211> 681

<212> DNA

<213> Discosoma species

<400> 37

```

atgggtgcgt cctccaagaa cgtcatcaag gagttcatgc gcttcaaggt gcgcatggag 60
ggcaccgtga acggccacga gttcgagatc gagggcgagg gcgagggccg cccctacgag 120
ggccacaaca ccgtgaagct gaaggtgacc aagggcgggc ccctgccctt cgcctgggac 180
atcctgtccc cccagttcca gtacggctcc aaggtgtacg tgaagcacc cgcgcacatc 240
cccgactaca agaagctgtc cttccccgag ggcttcaagt gggagcgcgat gatgaacttc 300
gaggacggcg gcgtggcgac cgtgacccaa gactcctccc tgcaggacgg ctgcttcac 360
tacaaggtga agttcatcgg cgtgaacttc ccctccgacg gccccgtaat gcagaagaag 420
accatgggct gggaggcctc caccgagcgc ctgtaccccc gcgacggcgt gctgaagggc 480
gagacccaca aggccctgaa gctgaaggac ggcggccact acctgggtgga gttcaagtcc 540
atctacatgg ccaagaagcc cgtgcagctg cccggctact actacgtgga cgccaagctg 600
gacatcacct cccacaacga ggactacacc atcgtggagc agtacgagcg caccgagggc 660
cgccaccacc tgttcctgta g 681

```

<210> 38

<211> 675

<212> DNA

<213> Discosoma species

<400> 38

```
atggcctcct ccgagaacgt catcaccgag ttcattgcgt tcaaggtgcg catggagggc 60
accgtgaacg gccacgagtt cgagatcgag ggcgagggcg agggccgccc ctacgagggc 120
cacaacaccg tgaagctgaa ggtgaccaag ggcggccccc tgccttcgc ctgggacatc 180
ctgtccccc agttccagta cggctccaag gtgtacgtga agcaccgccg cgacatcccc 240
gactacaaga agctgtcctt ccccgagggc ttcaagtggg agcgcgtgat gaacttcgag 300
gacggcgggc tggcgaccgt gacccaggac tcctccctgc aggacggctg cttcatctac 360
aaggtgaagt tcatcggcgt gaacttcccc tccgacggcc cctgatgca gaagaagacc 420
atgggctggg aggcctccac cgagcgcctg taccgccgcg acggcgtgct gaagggcgag 480
accacaagg ccctgaagct gaaggacggc ggccactacc tgggtggagtt caagtccatc 540
tacatggcca agaagcccgt gcagctgccc ggctactact acgtggacgc caagctggac 600
atcacctccc acaacgagga ctacaccatc gtggagcagt acgagcgcac cgagggccgc 660
caccacctgt tcctg 675
```

<210> 39

<211> 707

<212> DNA

<213> Anemonia sulcata

<400> 39

```
ggatccgcct ccctgctgac cgagaccatg cccttcagga ccaccatcga gggcacctg 60
aacggccact acttcaagt caccggcaag ggcgagggca acccctcga gggcacccag 120
gagatgaaga tcgaggtgat cgagggcggc ccctgcctt tcgccttcca catcctgtcc 180
acctcctgca tgtacggctc caaggccttc atcaagtacg tgtccggcat ccccgactac 240
ttcaagcagt ccctccccga gggcttcacc tgggagcgca ccaccaccta cgaggacggc 300
ggcttcctga ccgccaccca ggacacctcc ctggacggcg actgcctggg gtacaagggtg 360
aagatcctgg gcaacaactt ccccgccgac ggccccgtga tgcagaacaa ggccggccgc 420
tgggagccct ccaccgagat cgtgtacgag gtggacggcg tgctgcgcgg ccagtccctg 480
atggccctgg agtgccccgg cggtcgccac ctgacctgcc acctgcacac cacctaccgc 540
tccaagaagc ccgcctccgc cctgaagatg cccggcttcc acttcgagga ccaccgcac 600
gagatcctgg aggaggtgga gaagggaag tgctacaagc agtacgaggc cgccgtgggc 660
cgctactgcg acgccgcccc ctccaagctg ggccacaact gaagctt 707
```

<210> 40

<211> 231

<212> PRT

<213> Anemonia sulcata

<400> 40

```
Ala Ser Leu Leu Thr Glu Thr Met Pro Phe Arg Thr Thr Ile Glu Gly
 1             5             10             15
Thr Val Asn Gly His Tyr Phe Lys Cys Thr Gly Lys Gly Glu Gly Asn
      20             25             30
Pro Leu Glu Gly Thr Gln Glu Met Lys Ile Glu Val Ile Glu Gly Gly
      35             40             45
Pro Leu Pro Phe Ala Phe His Ile Leu Ser Thr Ser Cys Met Tyr Gly
      50             55             60
```

Ser	Lys	Ala	Phe	Ile	Lys	Tyr	Val	Ser	Gly	Ile	Pro	Asp	Tyr	Phe	Lys
65					70					75					80
Gln	Ser	Leu	Pro	Glu	Gly	Phe	Thr	Trp	Glu	Arg	Thr	Thr	Thr	Tyr	Glu
				85					90					95	
Asp	Gly	Gly	Phe	Leu	Thr	Ala	His	Gln	Asp	Thr	Ser	Leu	Asp	Gly	Asp
			100					105					110		
Cys	Leu	Val	Tyr	Lys	Val	Lys	Ile	Leu	Gly	Asn	Asn	Phe	Pro	Ala	Asp
		115					120					125			
Gly	Pro	Val	Met	Gln	Asn	Lys	Ala	Gly	Arg	Trp	Glu	Pro	Ser	Thr	Glu
	130					135					140				
Ile	Val	Tyr	Glu	Val	Asp	Gly	Val	Leu	Arg	Gly	Gln	Ser	Leu	Met	Ala
145					150					155					160
Leu	Glu	Cys	Pro	Gly	Gly	Arg	His	Leu	Thr	Cys	His	Leu	His	Thr	Thr
				165					170					175	
Tyr	Arg	Ser	Lys	Lys	Pro	Ala	Ser	Ala	Leu	Lys	Met	Pro	Gly	Phe	His
			180					185					190		
Phe	Glu	Asp	His	Arg	Ile	Glu	Ile	Leu	Glu	Glu	Val	Glu	Lys	Gly	Lys
		195					200					205			
Cys	Tyr	Lys	Gln	Tyr	Glu	Ala	Ala	Val	Gly	Arg	Tyr	Cys	Asp	Ala	Ala
	210					215					220				
Pro	Ser	Lys	Leu	Gly	His	Asn									
225					230										

<210> 41

<211> 699

<212> DNA

<213> Anemonia sulcata

<400> 41

atggcctcct	tctgaagaa	gaccatgccc	ttcaagacca	ccatcgaggg	caccgtgaac	60
ggccactact	tcaagtgcac	cggcaagggc	gagggcaacc	ccttcgaggg	cacccaggag	120
atgaagatcg	aggtgatcga	gggcggcccc	ctgcccttcg	ccttccacat	cctgtccacc	180
tcttgcattgt	acggctccaa	ggccttcac	aagtacgtgt	ccggcatccc	cgactacttc	240
aagcagtcct	tccccgaggg	cttcacctgg	gagcgcacca	ccacctacga	ggacggcggc	300
ttctgaccg	cccaccagga	cacctccctg	gacggcgact	gcctgggtgta	caaggtgaag	360
atcctgggca	acaacttccc	cgccgacggc	cccgtgatgc	agaacaaggc	cggccgctgg	420
gagccctcca	ccgagatcgt	gtacgaggtg	gacggcgctg	tgcgcggcca	gtccctgatg	480
gccctgaagt	gccccggcgg	ccgccacctg	acctgccacc	tgcacaccac	ctaccgctcc	540
aagaagcccc	cctccgccct	gaagatgccc	ggcttccact	tgcaggacca	ccgcatcgag	600
atcatggagg	aggtggagaa	gggcaagtgc	tacaagcagt	acgaggccgc	cgtgggcccgc	660
tactgcgacg	ccgccccctc	caagctgggc	cacaactga			699

<210> 42

<211> 232

<212> PRT

<213> Anemonia sulcata

<400> 42

Met	Ala	Ser	Phe	Leu	Lys	Lys	Thr	Met	Pro	Phe	Lys	Thr	Thr	Ile	Glu
1				5				10						15	

Gly	Thr	Val	Asn	Gly	His	Tyr	Phe	Lys	Cys	Thr	Gly	Lys	Gly	Glu	Gly
			20					25					30		
Asn	Pro	Phe	Glu	Gly	Thr	Gln	Glu	Met	Lys	Ile	Glu	Val	Ile	Glu	Gly
		35					40					45			
Gly	Pro	Leu	Pro	Phe	Ala	Phe	His	Ile	Leu	Ser	Thr	Ser	Cys	Met	Tyr
	50					55					60				
Gly	Ser	Lys	Ala	Phe	Ile	Lys	Tyr	Val	Ser	Gly	Ile	Pro	Asp	Tyr	Phe
65					70					75				80	
Lys	Gln	Ser	Phe	Pro	Glu	Gly	Phe	Thr	Trp	Glu	Arg	Thr	Thr	Thr	Tyr
			85						90					95	
Glu	Asp	Gly	Gly	Phe	Leu	Thr	Ala	His	Gln	Asp	Thr	Ser	Leu	Asp	Gly
			100					105					110		
Asp	Cys	Leu	Val	Tyr	Lys	Val	Lys	Ile	Leu	Gly	Asn	Asn	Phe	Pro	Ala
		115					120						125		
Asp	Gly	Pro	Val	Met	Gln	Asn	Lys	Ala	Gly	Arg	Trp	Glu	Pro	Ser	Thr
	130					135					140				
Glu	Ile	Val	Tyr	Glu	Val	Asp	Gly	Val	Leu	Arg	Gly	Gln	Ser	Leu	Met
145					150					155					160
Ala	Leu	Lys	Cys	Pro	Gly	Gly	Arg	His	Leu	Thr	Cys	His	Leu	His	Thr
			165						170					175	
Thr	Tyr	Arg	Ser	Lys	Lys	Pro	Ala	Ser	Ala	Leu	Lys	Met	Pro	Gly	Phe
			180						185					190	
His	Phe	Glu	Asp	His	Arg	Ile	Glu	Ile	Met	Glu	Glu	Val	Glu	Lys	Gly
		195					200					205			
Lys	Cys	Tyr	Lys	Gln	Tyr	Glu	Ala	Ala	Val	Gly	Arg	Tyr	Cys	Asp	Ala
	210					215					220				
Ala	Pro	Ser	Lys	Leu	Gly	His	Asn								
225						230									

<210> 43
 <211> 678
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> hybrid construct

<400> 43
 atgagctgca gcaagaacgt gatcaaggag ttcattgctgt tcaaggtgct gatggagggc 60
 accgtgaacg gccacgagtt cgagatcaag ggcgagggcg agggccggcc ctacgagggc 120
 cactgcagcg tgaagctcat ggtgaccaag ggcggccccc tccccttcgc ctctgacatc 180
 ctcagccccc agttccagta cggcagcaag gtgtacgtga agcaccctgc cgacatcccc 240
 gactacaaga agctcagctt ccccgagggc ttcaagtggg agcgggtgat gaacttcgag 300
 gacggcgggc tgggtgaccgt gagccaggac agcagcctca aggacggctg cttcatctac 360
 gaggtgaagt tcatcggcgt gaacttcccc agcgacggcc ccgtgatgca gcggcgacc 420
 cggggctggg aggcagcag cgagcggctc taccctcggg acggcgtgct caagggcgac 480
 atccacatgg ccctccggct cgagggcggc ggccactacc tcgtggagtt caagagcatc 540
 tacatggcca agaagcccggt gcagctcccc ggctactact acgtggacag caagctcgac 600
 atcaccagcc acaacgagga ctacaccatc gtggagcagt acgagcggac cgagggccgg 660
 caccacctct tcctctga 678

<210> 44
 <211> 225
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> hybrid construct

<400> 44
 Met Ser Cys Ser Lys Asn Val Ile Lys Glu Phe Met Arg Phe Lys Val
 1 5 10 15
 Arg Met Glu Gly Thr Val Asn Gly His Glu Phe Glu Ile Lys Gly Glu
 20 25 30
 Gly Glu Gly Arg Pro Tyr Glu Gly His Cys Ser Val Lys Leu Met Val
 35 40 45
 Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Leu Ser Pro Gln
 50 55 60
 Phe Gln Tyr Gly Ser Lys Val Tyr Val Lys His Pro Ala Asp Ile Pro
 65 70 75 80
 Asp Tyr Lys Lys Leu Ser Phe Pro Glu Gly Phe Lys Trp Glu Arg Val
 85 90 95
 Met Asn Phe Glu Asp Gly Gly Val Val Thr Val Ser Gln Asp Ser Ser
 100 105 110
 Leu Lys Asp Gly Cys Phe Ile Tyr Glu Val Lys Phe Ile Gly Val Asn
 115 120 125
 Phe Pro Ser Asp Gly Pro Val Met Gln Arg Arg Thr Arg Gly Trp Glu
 130 135 140
 Ala Ser Ser Glu Arg Leu Tyr Pro Arg Asp Gly Val Leu Lys Gly Asp
 145 150 155 160
 Ile His Met Ala Leu Arg Leu Glu Gly Gly Gly His Tyr Leu Val Glu
 165 170 175
 Phe Lys Ser Ile Tyr Met Ala Lys Lys Pro Val Gln Leu Pro Gly Tyr
 180 185 190
 Tyr Tyr Val Asp Ser Lys Leu Asp Ile Thr Ser His Asn Glu Asp Tyr
 195 200 205
 Thr Ile Val Glu Gln Tyr Glu Arg Thr Glu Gly Arg His His Leu Phe
 210 215 220
 Leu
 225

<210> 45
 <211> 898
 <212> DNA
 <213> Discosoma species

<400> 45
 gtcctcccaa gcagtgggtat caacgcagag tacgggggag tttcagccag tgacgggtcag 60
 tgacagggtg agccacttgg tataccaaca aaatgagggtc ttccaagaat gttatcaagg 120
 agttcatgag gtttaagggtt cgcattggaag gaacgggtcaa tgggcacgag tttgaaatag 180
 aaggcgaagg agagggggagg ccatacgaag gccacaatac cgtaaagctt aaggtaacca 240

```

aggggggacc tttgccattt gcttgggata ttttgtcacc acaatttcag tatggaagca 300
aggtatatgt caagcaccct gccgacatac cagactataa aaagctgtca tttcctgaag 360
gatttaaagt ggaaagggtc atgaactttg aagacggtgg cgtcgttact gtaaccagg 420
attccagttt gcaggatggc tgtttcatct acaagtcaag ttcattggcg ttgaactttc 480
cttccgatgg acctgttatg caaaagaaga caatgggctg ggaagccagc actgagcgtt 540
tgtatcctcg tgatggcgtg ttgaaaggag agattcataa ggctctgaag ctgaaagacg 600
gtggtcatta cctagttgaa ttcaaaagta tttacatggc aaagaagcct gtgcagctac 660
cagggtacta ctatgttgac tccaaactgg atataacaag ccacaacgaa gactatacaa 720
tcgttgagca gtatgaaaga accgagggac gccaccatct gttcctttaa ggctgaactt 780
ggctcagacg tgggtgagcg gtaatgacca caaaaggcag cgaagaaaaa ccatgatcgt 840
tttttttagg ttggcagcct gaaatcgtag gaaatacatc agaatgtta caaacagg 898

```

<210> 46

<211> 205

<212> PRT

<213> Discosoma species

<400> 46

```

Met Arg Ser Ser Lys Asn Val Ile Lys Glu Phe Met Arg Phe Lys Val
 1          5          10         15
Arg Met Glu Gly Thr Val Asn Gly His Glu Phe Glu Ile Glu Gly Glu
          20          25          30
Gly Glu Gly Arg Pro Tyr Glu Gly His Asn Thr Val Lys Leu Lys Val
          35          40          45
Thr Lys Gly Gly Pro Leu Pro Phe Ala Trp Asp Ile Leu Ser Pro Gln
          50          55          60
Phe Gln Tyr Gly Ser Lys Val Tyr Val Lys His Pro Ala Asp Ile Pro
65          70          75          80
Asp Tyr Lys Lys Leu Ser Phe Pro Glu Gly Phe Lys Trp Glu Arg Val
          85          90          95
Met Asn Phe Glu Asp Gly Gly Val Val Thr Val Thr Gln Asp Ser Ser
          100         105         110
Leu Gln Asp Gly Cys Phe Ile Tyr Lys Ser Ser Ser Leu Ala Leu Asn
          115         120         125
Phe Pro Ser Asp Gly Pro Val Met Gln Lys Lys Thr Met Gly Trp Glu
          130         135         140
Ala Ser Thr Glu Arg Leu Gly His Tyr Leu Val Glu Phe Lys Ser Ile
145          150          155          160
Ile Met Ala Lys Lys Pro Val Gln Leu Pro Gly Tyr Tyr Tyr Val Asp
          165          170          175
Ser Lys Leu Asp Ile Thr Ser His Asn Glu Asp Tyr Thr Ile Val Glu
          180          185          190
Gln Tyr Glu Arg Ser Glu Gly Arg His His Leu Phe Leu
          195          200          205

```